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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,710	03/10/2004	Michael E. Yoder	200314971-1	6166

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EXAMINER	
BRADLEY, MATTHEW A	
ART UNIT	**PAPER NUMBER**
2187	

NOTIFICATION DATE	DELIVERY MODE
01/04/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/798,710	YODER, MICHAEL E.	
	Examiner	Art Unit	
	Matthew Bradley	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,9-11,13-15,18 and 22-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1, 3-7, 9-10, and 23* is/are allowed.

6)☒ Claim(s) *11,13-15,18,22 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This Office Action has been issued in response to amendment filed 1 October 2007. Applicant's arguments have been carefully and fully considered but they are not fully persuasive. Accordingly, this action has been made FINAL.

Claim Status

Claims 1, 3-7, 9-11, 13-15, 18, and 22-24 remain pending and are ready for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **11**, **22**, and **24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grigor and in view of Koenen (U.S. 2004/0019891), hereinafter referred to as Koenen.

As per independent claim **11**, the combination of Grigor and Koenen teach,

- multiple symmetric multiprocessing (SMP) nodes; (Figure 1 as described in Paragraphs 0019-0021 of Koenen)
- multiple central processing units (CPUs) at each SMP node; (Figure 1 as described in Paragraphs 0019-0021 of Koenen)

- a memory control unit at each SMP node which is coupled to each CPU at that SMP node; (Figure 1, items 12I, 14I, and 16I as described in Paragraphs 0019-0021 of Koenen)
- shared memory at each SMP node which is accessible by way of the memory control unit at that SMP node; (Figure 1, items 12H, 14H, 16H, as described in Paragraphs 0019-0021 of Koenen)
- a switching system coupled to the memory control units so as to interconnect the multiple SMP nodes; (Figure 1, item 18 as described in Paragraphs 0019-0021 of Koenen)
- an operating system running on the CPUs; (Paragraph 0027, taught as 'the O/S' of Koenen)
- a virtual memory (VM) fault handler within the operating system; and (Paragraph 0047 of Koenen)
- a VM locality module within the operating system; wherein the VM locality module is configured to receive a locality request from the VM fault handler, the locality request including an indication of a search policy to use from among a plurality of search policies, and is further configured to form a data structure based on the search policy that was indicated (Column 4 lines 33-62 of Grigor with respect to the comments made supra in independent claim 1).

Grigor teach a multiple processor system, but does not explicitly teach the hardware components that are found in Koenen which is relied upon as noted supra.

Grigor and Koenen are from the same field of endeavor, namely memory allocation for multiple processor computing systems.

At the time of invention, it would have been obvious to one of ordinary skill in the art, having both the teachings of Grigor and Koenen before him/her to combine the allocation scheme of Grigor with Koenen for the benefit of allowing allocated blocks to remain contiguous. As both systems teach multiple processor allocation, the allocation scheme of Grigor would be beneficial to Koenen for the reason noted.

The suggestion for doing so would have been that, sharing memory in this manner allows the memory allocation to each of the processors to be flexible and the allocated blocks remain contiguous (Column 2 lines 25-29 of Grigor).

Therefore, it would have been obvious to combine Grigor with Koenen for the benefit of Grigor's allocation scheme to obtain the invention as specified in claims 11, 22, and 24.

As per independent claim **22**, the combination of Grigor and Koenen teach, a virtual memory manager configured for extending a memory space beyond limits of a physical address space; a virtual memory fault handler configured to interrupt execution of the virtual memory manager when a page fault occurs; and a virtual memory locality module configured to receive a locality request from the virtual memory fault handler, to form a data structure having sets of equidistant physical memory based on a search policy indicated in the locality request, and to rapidly select a physical memory locality in the system using a pointer to the data structure (the Examiner incorporates herein the rejections made supra with respect to claims 1 and 11).

As per dependent claim **24**, the combination of Grigor and Koenen teach, wherein the VM locality module is further configured to determine a preferred locality using a pointer to a locality within the data structure (Paragraph 0052 of Koenen).

Claims **13-15** and **18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grigor and in view of Koenen and further in view of Horstmann et al (U.S. 6,125,433), hereinafter referred to as Horstmann. (The Microsoft Computer Dictionary Fifth Edition is used as evidentiary support).

As per dependent claim **13**, the combination of Grigor and Koenen teach wherein the shared memory includes both local memory and wherein the plurality of search policies include at least a closest first search policy y (Grigor as shown in dependent claim 4 above as well as Horstmann Column 1 lines 57-67).

Grigor does not explicitly teach, an interleaved memory or an interleaved first search policy.

Horstmann teaches, wherein the shared memory includes interleaved memory, and wherein the plurality of search policies include an interleaved first search policy (Horstmann Column 1 lines 57-67).

The combination of Grigor and Koenen, and Horstmann are analogous art because they are from the same field of endeavor namely, memory allocation.

At the time of invention, it would have been obvious to one of ordinary skill in the art, having both the teachings of Grigor, Koenen, and Horstmann before him/her to combine the interleaved allocation of Horstmann with Grigor and Koenen for the benefit of reducing wait states and using available memory efficiently.

The suggestion for doing so would have been that, interleaved allocation provides an efficient use of main memory. For example, a process's main memory allocation need not be contiguous; processes in main memory can be interleaved (Column 1 lines 61-64 of Horstmann). Further, in the Microsoft Computer Dictionary, interleaved memory is defined as a method of organizing addresses in RAM memory in order to reduce wait states. Given this ordinary definition, it would have been obvious to implement interleaved memory into Grigor and Koenen to further improve the allocation methods of Grigor and Koenen.

Therefore, it would have been obvious to combine Grigor and Koenen with Horstmann for the benefit of interleaved memory to obtain the invention as specified in claims 13-15 and 18.

As per dependent claim **14**, the combination of Grigor and Koenen, and Horstmann teach, wherein the data structure for the closest first search policy comprises a first set including a closest local memory locality and one or more other sets of equidistant localities (Column 4 line 63 to Column 5 line 2 of Grigor).

As per dependent claims **15** and **18**, the combination of Grigor and Koenen, and Horstmann teach, wherein the physical memory localities further includes interleaved memory in the system (Column 1 lines 61-64 of Horstmann).

Allowable Subject Matter

Claims **1**, **3-7**, **9-10**, and **23** are allowed.

Response to Arguments

Applicant's arguments filed 1 October 2007 have been carefully and fully considered but are not fully persuasive.

With respect to Applicant's argument located within the last paragraph of the third page of the instant remarks (numbered as page 9) and continuing on to the top of the fourth page of the instant remarks (numbered as page 10) which recites:

> *"Independent claim 11 has similar limitations as the limitations discussed above in relation to claim 1. In particular, claim 11 recites that "the VM locality module is configured to receive a locality request from the VM fault handler, the locality request including an indication of a search policy to use from among a plurality of search policies, and is further configured to form a data structure based on the search policy that was indicated." (Emphasis added.) As such, applicant respectfully submits that, for similar reasons as discussed above in relation to claim 1, claim 11 also overcomes its rejection based on Grigor."*

The Examiner respectfully disagrees. First, Applicant's arguments are not commensurate in scope with the instant claim language. Applicant's argue that 'independent claim 11 has similar limitations as the limitations discussed above in relation to claim 1' and that as such, the arguments to claim 1 apply to claim 11. However, the Examiner notes that claim 1 as amended recites 'sending a locality request' wherein claim 11 recites 'receive a locality request.' Thus, Applicant's referenced arguments are not commensurate in scope with the instant claim language. Further, the Examiner also wishes to notes that Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

With respect to Applicant's argument located within the two full paragraphs of the fourth page of the instant remarks (numbered as page 10) which recites:

> *"Claims 13-15, 18, and 24 depend from claim 11. Hence, applicant respectfully submits that claims 13-15, 18, and 24 also overcome their rejection for at least the reasons given above in relation to claim 11. Claim 22 has similar limitations as the limitations discussed above in relation to claim 1. In particular, claim 22 recites that "a virtual memory locality module configured to receive a locality request from the virtual memory fault handler, to form a data structure having sets of equidistant physical memory based on a search policy indicated in the locality request, ... " (Emphasis added.) As such, applicant respectfully submits that, for at least the same reasons as discussed above in relation to claim 1, claim 22 also overcomes its rejection based on Grigor."*

The Examiner respectfully disagrees and incorporates by reference herein the comments made *supra.*

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant t-o 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached on 6:30-3:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DAS/mb

DONALD SPARKS
SUPERVISORY PATENT EXAMINER